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National Weather Service Quad Cities IA/IL

Weather Home Companion

Inside This Issue:

Weather Home Companion is a semiannual publication of the National Weather Service office in the Quad Cities.

Our 10th year of publication!

Clouds

Terry Simmons

Have you ever been told to get your head out of the clouds? The comment is frequently associated with daydreaming, but cloud watching can be an enjoyable pastime. Perhaps you recall learning about basic cloud types in elementary school, their heights, and the conditions in which they form, but maybe you have not given clouds much thought since then.

Life would be duller without clouds. They bring drama and variety to the sky. Painters and poets use clouds, or descriptions of clouds, to add excitement or convey a pastoral element to a scene. Gazing at clouds can elicit rational thoughts, such as what is the structure of the cloud, how, or why has it formed? They can evoke an emotional response, like how does this cloud make me feel? However, from a practical point of view clouds are a good indicator of present

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What Does A NWS Office Do?

Steve Kuhl

The National Weather Service was founded in *1870* as part of the U.S. Army Signal Corp. Since that time the mission of the NWS has been to "Protect Lives and Property and Enhance the National Economy." Your local NWS Quad Cities Weather Forecast Office is located at the Davenport Municipal Airport. The office provides warnings, forecasts, and hydrologic information to the public, media, emergency management, aviation community, and other customers 24 hours per day, 365 days per year. The office is part of the National Oceanic and Atmospheric Administration (NOAA) which is part of the United States Department of Commerce (DOC).

The NWS Quad Cities forecast service area consists of 36 counties; 13 in northwest Illinois, 21 in eastern Iowa; and 2 in extreme

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What Does A NWS Office Do?

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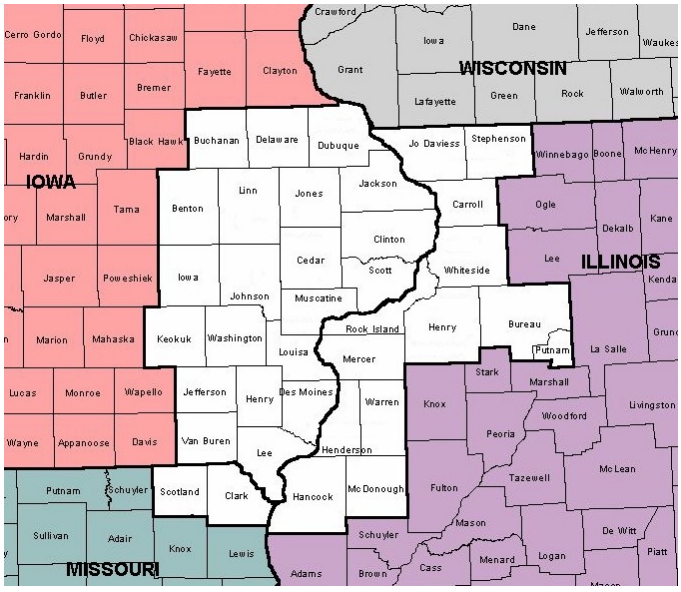
northeast Missouri (white area in graphic below). We are responsible to protect the lives and property of a population over 1.45 million people in an 20,000 square mile area.

So Who Does What?

The Quad Cities NWS Office is staffed by 23 professionals:

Thirteen meteorologists (forecasters) with bachelors or master degrees work around the clock in eight-hour rotating shifts. Our meteorologists prepare forecasts, issue warnings, watches, and advisories, aviation and fire weather forecasts, and river forecasts and flood warnings. Meteorologist Interns and Hydrometeorological Technicians (HMTs) monitor weather observations, run the Cooperative Weather Observing Program, collect and disseminate river and rainfall data, launch balloons to gather upper-air weather data, and prepare local climatological data summaries and reports. Two Electronic Technicians and an Information Technology Officer keep computers and electronic systems up and running. The Service Hydrologist provides river and flood forecasts for public warnings, operation of reservoirs, availability of water supply, river flow management, research, and many other purposes. The Administrative Support Assistant performs all administrative functions for the office.



NWS Quad Cities forecast service area (in white), encompassing much of eastern Iowa, far northeast Missouri and portions of northwest Illinois.

National Weather Service Quad Cities forecast office, located at the Davenport Municipal Airport.

The Office Leadership Team consists of the Meteorologist-in-Charge who is responsible to ensure the office runs efficiently. This includes administrative duties; personnel management; and working forecasts shifts when needed. The Warning Coordination Meteorologist is the most visible person to the public. The WCM coordinates warning functions, provides weather safety talks and tours, conducts spotter training classes, works with emergency management, and is the office's voice to the media. The Science Operations Officer serves as the senior scientific advisor to operations and is in charge of research and training. The Data Acquisition Program Manager oversees data collection, quality, and dissemination programs. The Electronic Systems Analyst oversees scheduling, installation, and maintenance of all electronic equipment.

So there you have it! Now you know what your NWS Quad Cities Office does and the role of each dedicated professional that works there day in and day out to "protect your lives and property."

Clouds

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weather conditions and the weather to come.

Clouds provide evidence of moisture in the atmosphere, since they are basically suspended water droplets. When air that is sufficiently moist reaches its dew point temperature water droplets in the air condense allowing the cloud to become visible. The clouds' appearance is determined by the nature, distribution, and space between the water particles. The intensity and color of light received by the cloud and the relative position of the observer to the cloud allow the cloud to be described.

Before 1800, mariners and farmers used clouds forecasting tools. Individuals described clouds by color, form, or grouping, but there were no common scientific or meteorological definitions. Most observers considered clouds a transitory essence not worthy of being studied with any rigor. Clouds floated in the sky, their position and behavior changed each day, there were no common names, and there was little understanding of how or why they formed. All of this changed during the winter of 1802-1803 when Luke Howard, a young pharmacist in England, shared a paper he had written with a group of scientists. Howard presented a basic classification scheme to identify clouds by shape and position in the atmosphere.

Howard's approach assigned Latin words to three basic shapes of clouds: heap clouds with flat bottoms and cauliflower shaped tops (cumulus); layers of clouds, wider than they are thick (stratus); and wispy curls, similar to strands of hair (cirrus). Howard used the Latin name nimbus, which means rain, to describe clouds from which precipitation falls. Latin was the language of scholarship. By using Latin Howard's descriptions were able to transcend national borders and a diversity of cultures.

A formal system for classification of clouds gained wide acceptance in Britain, Germany, and other countries; and by 1896, the International Cloud Atlas was published to provide a consistent vocabulary for describing clouds. Besides expanded descriptions, the book featured color plates of clouds with text in English, French, and German. Color photography was relatively new, complicated, and expensive at that time, yet the 'Cloud

Examples of common cloud types as described by Luke Howard's cloud classification scheme. (Source NOAA Photo Library)

Atlas' was considered well worth the investment due to the beauty of the illustrations. Later editions were modified to lower costs.

The cloud atlas incorporated detailed explanations of appearance by describing cloud luminance, the amount of light reflected, scattered, and transmitted by cloud particles, and color. During daytime, luminance makes clouds observable. On a moonless night clouds are generally invisible, but their presence can be deduced by the obscuration of stars, or by direct illumination from

Clouds

Page from an early German cloud atlas, by Thomas Forster, 1819. (Source: NOAA Photo Library)

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below, such as from a large fire or the lights over a city. Haze changes the contrast between a cloud and its surroundings, and this can affect luminance by making cloud shape, structure, and texture difficult to discern.

Cloud height causes the color of a cloud to change, and haze between the observer and the cloud can also modify the color of a cloud. For example, when the sun is high above the horizon clouds are generally white or grey and when the sun is near the horizon cloud colors may change from yellow through orange to red. Differences in color make it possible for the observer to get an idea of the height of a cloud. Clouds at the same level can appear less red when they are viewed toward the sun, and blueness of the sky can also affect the color observed. Meanwhile, cloud colors at night can be imperceptible unless the clouds are illuminated.

Clouds develop in high, middle, or low altitudes with each category defined by a range of levels at which certain types of clouds occur most frequently. Cloud types develop within basic altitudes, but some types, such as a cloud that produces a thunderstorm, can extend into other cloud levels. Latitude affects the height at which clouds develop. For example, clouds in Polar Regions typically develop at lower heights than clouds in tropical regions. Whenever possible, cloud height should be determined by measurements rather than estimates.

Identification by cloud form or category is helpful. However, cloud descriptions can be more complex when a cloud is defined by appearance and characteristics. For example, is the cloud detached, delicate, fibrous, or silky? Is it patchy or sheet-like, smooth or clumpy? Do clouds totally or partially cover the sky? Are the clouds transparent or opaque?

Some people take photographs to capture examples of rare, beautiful, or weird shaped clouds. Others may favor technological advances such as automated observing systems and radar observations over examining the sky. Whatever your reason, or method, making time to watch clouds can be enjoyable.

To make a cloud wheel to help you identify clouds visit the following site:
http://www.srh.noaa.gov/srh/jetstream/downloads/cloudwheel_10.pdf

Additional resources:

http://vortex.plymouth.edu/clouds.html/

http://www.wrh.noaa.gov/fgz/science/clouds.php

http://islandnet.com/~see/weather/history/howard.htm

http://www.ucar.edu/news/features/clouds/

http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/cld/home.rxml

COOP NEWS

Length of Service Awards

Thomas Olsen

Institution: 75 Years

Bellevue Lock and Dam # 12

Bellevue Lock and Dam #12 Employees, (from left-right), Randy Hitchcock, and Assistant Lockmaster John Williams were presented the 75 year Institutional Length of Service Award. Presenting the award were Meteorologist Intern Tim Gross (far right), and Meteorologist John Haase (photographer).

Institution: 50 Years

Fairfield Municipal Water Works

Fairfield Iowa Water Treatment employees (from left-right), Jeff Dunbar, Steve Redinger, Scott Worley, Julie Vorhies, and Plant Supervisor Carl Chandler were presented the 50 year Institutional Length of Service Award. Presenting the award were Meteorologist Intern Tom Philips (top row and far left) and Hydro Meteorological Technician Tom Olsen (photographer).

Institution: 25 Years

Apple River Canyon State Park

Apple River Canyon State Park employee Steve Meyer (left), was presented the 25 year Institutional Length of Service Award. Presenting the award was Meteorologist John Haase (right) and Meteorologist Intern Tim Gross (photographer).

Individual Length of Service Awards: 10 Years

Veterinarians Fay Vittetoe (right), and Mary Anson (left) of Brighton, IA, were presented a 10 year Length of Service Award. Hydro-Meteorological Technician Tom Olsen (center) presented the award.

For over 10 years, even in their busy lives as Veterinarians, Fay and Mary find the time to take daily rainfall, winter snowfall and as needed Skunk River stage readings. The staff at the National Weather Service Office in Quad Cities thanks you both for volunteering your time and energy to the COOP Observing Program. We appreciate your service and tireless dedication.

Catherine Winslow (left), and her "never misses a photo opportunity" dog, Bear, of Galena, IL, were presented a 10 year Length of Service Award. Meteorologist John Haase (right) and Meteorologist Intern Tim Gross (photographer) presented the award.

For over 10 years, even in her busy life as a local store owner and dedicated dog owner, Catherine dutifully takes daily temperatures, rainfall, and winter snowfall readings. The staff at the NWS Office in Quad Cities thanks you for volunteering your time and energy to the COOP Observing Program. We appreciate your service and tireless dedication.

Impact-Based Warnings

Donna Dubberke

In response to key findings from recent service assessments of devastating tornadoes (particularly the EF-5 tornado in Joplin, MO), an experimental National Weather Service warning enhancement is being used across much of the central U.S. this thunderstorm season.

The Impact Based Warning (IBW) experiment is an effort to better communicate severe weather threats within National Weather Service warnings. While the basic function of Severe Thunderstorm and Tornado Warnings will remain the same, additional enhanced information will be provided within the warning to provide expected "impact" information.

Find out more:

Check out this video for more details:
http://youtu.be/WcxnWOcB3qg

Provide input on the IBW demonstration:
http://goo.gl/buxTZ

Goals:

- Provide additional valuable information to media and Emergency Management officials
- Facilitate improved public response and decision making
- Better meet societal needs in the most life-threatening weather events
- Improve communication of critical information
- Make it easier to quickly identify the most valuable information
- Enable prioritization of key warnings in your area of interest
- Indicate different levels of risk within the same product
- Enable the National Weather Service to express a confidence level of potential impacts

Weather History: The Great Northwest Tornado

Steve Kuhl

June 3, 1860 → One of the worst tornadoes of the 19th Century brought death and destruction along its 80 mile path from Cedar County, IA to Lee County, IL, and came to be known as the Great Tornado of the Northwest.

Camanche, IA, on the Mississippi River, was hardest hit with much of the town ruined. A boat passing by on the river was struck, resulting in 23 fatalities and the few survivors finding themselves on the Illinois shore with no recollection of how they got there. The tornado was 3/4 of a mile wide and took a total of 92 lives. It was just one of several immense tornadoes that hit Iowa and northern Illinois that day.

For more information:

See article on the NWS Quad Cities Website:

http://www.crh.noaa.gov/dvn/?n=camanchetornado

Also, an article was published in the Spring/ Summer 2010 *Weather Home Companion* commemorating the 150th anniversary of this tragic event:

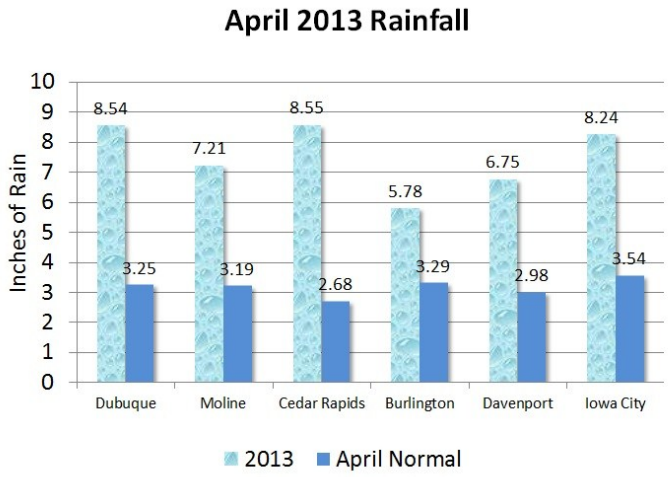
http://www.crh.noaa.gov/images/dvn/downloads/spring2010.pdf

Record Rainfall and Flooding Spring 2013

Maren Stoflett

John Haase

A persistent pattern of upper level disturbances slowly moving across the Midwest resulted in numerous rounds of heavy rainfall across the area. This wet pattern led to periods of moderate to major flooding from March through July on area rivers, including a prolonged period of flooding on portions of the Mississippi River. Record flooding was observed at several river forecast locations (see table on page 11). The spring precipitation was an amazing turnaround from the severe drought that impacted the region last summer and fall (2012.)



April 2013 was 2 to 4 times wetter than normal across the area, with some locations experiencing the wettest April on record!

Location	Rainfall Total	Departure From Normal	Comments
Dubuque	8.54	+5.29	New Record for April. Previous record: 7.80 in 1896
Moline	7.21	+4.02	4th wettest April. 1) 11.30 in 1973, 2) 7.92 in 1965, 3) 7.36 in 1947
Cedar Rapids	8.55	+5.87	New Record for April. Previous record: 6.55 in 2008
Burlington	5.78	+2.49	
Davenport	6.75	+3.77	
Iowa City	8.24	+4.70	2nd wettest April. Wettest April: 8.32 in 1965

May 2013 saw near normal temperatures and well over twice the normal rainfall.

Location	Average Temperature	Departure From Normal	Rainfall Total	Departure From Normal
Burlington	63.1°	-0.6°	11.50"	+6.65"
Cedar Rapids	60.8°	+0.7°	7.25"	+3.20"
Davenport	62.4°	+1.6°	8.52"	+4.27"
Dubuque	59.0°	+0.2°	7.05"	+2.86"
Iowa City	61.9°	+0.5°	7.91"	+3.70"
Moline	62.5°	+0.7°	7.97"	+3.65"

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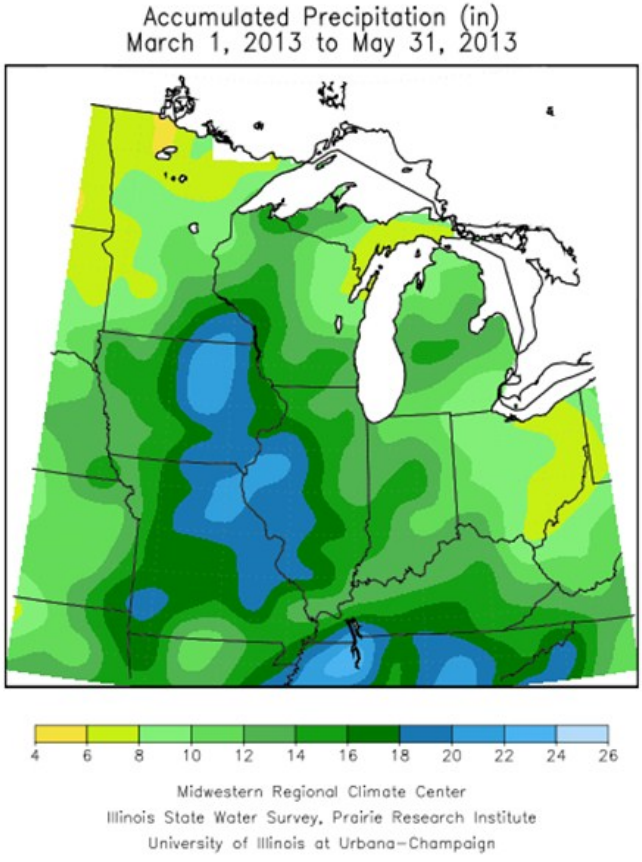
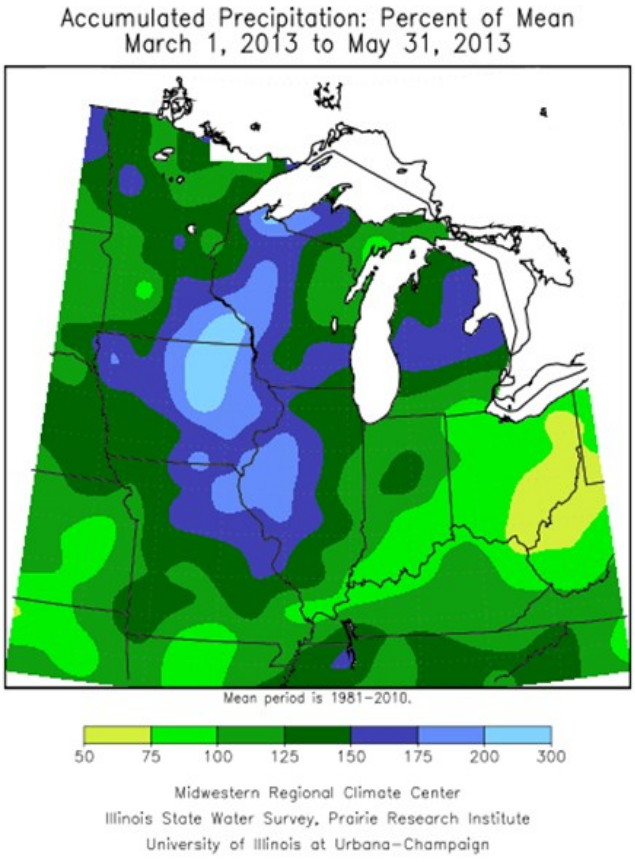
2013 Spring Season

The 2013 Spring Season (March-May) was characterized by temperatures that were 3.1 to 4.2 degrees cooler than normal and precipitation that was significantly above normal.

Location	Average Temperature	Departure From Normal	Precipitation Total	Departure From Normal
Burlington	48.8°	-4.2°	19.23"	+7.83"
Cedar Rapids	45.4°	-3.2°	18.24"	+8.94"
Davenport	46.7°	-3.1°	17.27"	+6.99"
Dubuque	43.5°	-3.9°	18.16"	+7.90"
Iowa City	46.8°	-3.5°	18.79"	+8.86"
Moline	47.5°	-3.3°	17.75"	+6.98"





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Record High River Levels 2013

(Preliminary data courtesy of the U.S. Geological Survey and the U.S. Army Corps of Engineers)

River Gage Location	*Flood Stage (feet)*	*Previous Record Stage (feet)*	*2013 Record Stage (feet)*
North Skunk River near Sigourney, IA	**16.0**	**25.33 on 3/31/1960**	**25.93 on 5/28/2013**
Rock River at Moline, IL	**12.0**	**16.38 on 3/06/2008**	**16.53 on 4/21/2013**
La Moine River at Colmar, IL	**20.0**	**27.03 on 1/03/1965**	**28.91 on 4/19/2013**

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